

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)



Date of mailing
(day/month/year) 15 JUNE 2005 (15.06.2005)

Applicant's or agent's file reference
FPS04083-PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/KR2005/000207

International filing date (day/month/year)

26 JANUARY 2005 (26.01.2005)

Priority date(day/month/year)

29 JANUARY 2004 (29.01.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC7 C08G 81/00, C08F 265/10, C08G 63/66, A61K 9/00

Applicant

SUNGKYUNKWAN UNIVERSITY Foundation for Corporate Collaboration Provost et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/000207

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/000207

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------|-----|
| Novelty (N) | Claims | 1-16 | YES |
| | Claims | NONE | NO |
| Inventive step (IS) | Claims | 1-16 | YES |
| | Claims | NONE | NO |
| Industrial applicability (IA) | Claims | 1-16 | YES |
| | Claims | NONE | NO |

2. Citations and explanations :

Reference is made to the following document:

D1 : KR 2000-12970 A (Gwangju Institute of Science and Technology)

The present invention according to claims 1-16 relates to a block copolymer formed by coupling the following components with each other, as well as a hydrogel composition comprising the block copolymer and a hydrogel formed from the composition: (a) a copolymer of a polyethylene glycol (PEG)-based compound with a biodegradable polymer; and (b) a sulfonamide-based oligomer. This block copolymer shows the sol-gel transition behavior sensitive to changes in not only temperature but also pH.

Document D1 cited in the search report, which is regarded as the closest prior art, discloses a pH sensitive polymer for a drug delivery system, biomaterial and biosensor. It is prepared by copolymerization of sulfonamide monomer and other monomer having amide group.

Comparing the present invention with D1, the subject matter of claims 1-16 differs in that a sulfonamide-based oligomer showing a change in ionization degree with a change in pH is coupled to a copolymer of a hydrophilic PEG-based compound with a biodegradable polymer, thus forming a novel block copolymer which can be used in actual drug delivery.

Therefore, the subject matter of claims 1-16 is consider to be novel, to involve an inventive step and to be industrially applicable.